

This listing of claims will replace all prior versions of claims in this application:

Listing of Claims:

Claim 1 (original): A method for wire bonding a finger sensor die to an external circuit, wherein the finger sensor die includes a sensor array having one or more die contacts that are wire bonded to one or more external contacts of the external circuit so that a usable portion of the sensor array is maximized, the method comprises steps of:

forming a ball at a first end of a bonding wire;

forming an electrically conductive connection between the ball and a selected external contact of the external circuit;

extending the bonding wire to a selected die contact so as to form a wire loop having a low loop height;

forming an electrically conductive stitch connection between a second end of the bonding wire and the selected die contact; and

repeating the above steps until the one or more die contacts are wire bonded to the one or more external contacts of the external circuit.

Claim 2 (new): The method of claim 1, wherein the step of extending is a step of extending the bonding wire to the selected die contact so as to form a wire loop having a low loop height that is substantially in the range of 1 to 2 mils.

Claim 3 (new): The method of claim 2, further comprising a step of encapsulating the bonding wires with an encapsulation material that forms a cavity around at least a portion of the sensor array, wherein the cavity has a cavity wall having a height (H) above the sensor array and wherein an inaccessible portion of the sensor array is substantially equivalent to a region defined by $(3.2 \times H)$.

Claim 4 (new): The method of claim 2, further comprising a step of encapsulating the bonding wires with an encapsulation material that forms a cavity around at least a portion of the sensor array, wherein the cavity has a cavity wall having a height (H) above the sensor array and wherein an inaccessible portion of the sensor array is substantially equivalent to a region defined by $(1.8 \times H)$.

Claim 5 (new): The method of claim 3, wherein the step of encapsulating comprises a step of forming the cavity wall to be perpendicular to the sensor array.

Claim 6 (new): The method of claim 3, wherein the step of encapsulating comprises a step of forming the cavity wall to be sloped.

Claim 7 (new): The method of claim 3, wherein the step of encapsulating comprises a step of forming the cavity wall to be stepped.

Claim 8 (new): The method of claim 3, wherein the step of encapsulating comprises a step of forming the cavity wall to be chamfered.

Claim 9 (new): The method of claim 3, wherein the value of H is substantially in the range of 1 to 2 mils.

Claim 10 (new): A method for wire bonding a finger sensor die to an external circuit, wherein the finger sensor die includes a top surface that includes a sensor array having one or more die contacts that are to be wire bonded to one or more external contacts of the external circuit, the method comprises steps of:

- forming an electrically conductive connection between a first end of a bonding wire and a selected external contact;

- extending the bonding wire to a selected die contact so as to form a wire loop that extends above the top surface by an amount substantially equal to 1.5 mils;

- forming an electrically conductive connection between a second end of the bonding wire and the selected die contact; and

- repeating the above steps until the one or more die contacts are electrically coupled to the one or more external contacts of the external circuit.

Claim 11 (new): The method of claim 10, wherein the fingerprint sensor is a stationary-type fingerprint sensor and the method further comprises a step of encapsulating the bonding wires with an encapsulation material that forms a cavity around at least two sides of the sensor array, wherein the cavity has cavity walls having a height (H) above the sensor array and wherein an inaccessible portion of the sensor array is substantially equivalent to a region defined by $(1.8 \times H)$.

12 (new): The method of claim 11, wherein the step of encapsulating comprises a step of forming the cavity wall to be perpendicular to the sensor array.

13 (new): The method of claim 11, wherein the step of encapsulating comprises a step of forming the cavity wall to be sloped.

14 (new): The method of claim 11, wherein the step of encapsulating comprises a step of forming the cavity wall to be stepped.

15 (new): The method of claim 11, wherein the step of encapsulating comprises a step of forming the cavity wall to be chamfered.

16 (new): The method of claim 11, wherein the value of H is substantially in the range of 1 to 2 mils.

17 (new): The method of claim 10, wherein the fingerprint sensor is a sweep-type fingerprint sensor and the method further comprises a step of encapsulating the bonding wires with an encapsulation material that forms a cavity around at least a portion of the sensor array, wherein the cavity has a cavity wall having a height (H) above the sensor array and wherein an inaccessible portion of the sensor array is substantially equivalent to a region defined by $(3.2 \times H)$.

18 (new): The method of claim 17, wherein the step of encapsulating comprises a step of forming the cavity wall to be perpendicular to the sensor array.

19 (new): The method of claim 17, wherein the step of encapsulating comprises a step of forming the cavity wall to be sloped.

20 (new): The method of claim 17, wherein the step of encapsulating comprises a step of forming the cavity wall to be stepped.

21 (new): The method of claim 17, wherein the step of encapsulating comprises a step of forming the cavity wall to be chamfered.

22 (new): The method of claim 17, wherein the value of H is substantially in the range of 1 to 2 mils.

23 (new): A method for wire bonding a finger sensor die to an external circuit, wherein the finger sensor die includes a sensor array having one or more die contacts that are wire bonded to one or more external contacts of the external circuit so that a usable portion of the sensor array is maximized, the method comprises steps of:

locating the finger sensor die having die contacts on a surface of the finger sensor die to the external circuit having external contacts on a surface of the external circuit, such that the surface of the finger sensor die is located to a position higher than the surface of the external circuit;

forming an electrically conductive connection between a bonding wire and a selected external contact of the external circuit;

extending the bonding wire from the selected external contact of the external circuit away from the surface of the external contact of the external circuit;

making a low loop height wire loop of the bonding wire by extending the bonding wire toward a selected die contact on the surface of the finger sensor die; and

forming an electrically conductive stitch connection between a second end of the bonding wire and the selected die contact.